Chapter

2

FACILITY INVENTORY

for the Airport Master Plan for Whiteriver Airport

2.0 INTRODUCTION

This chapter will document the collection and evaluation of information pertaining to several aspects of the Whiteriver Airport. The result of assembling and preparing this basic data (including an examination of physical characteristics of the airfield, surrounding land uses, and a socioeconomic profile of the area) will be a comprehensive source of information for future tasks in the Master Plan. The information in the inventory was obtained through on-site inspections, review of existing plans and documents, and interviews with the existing Airport Committee members, airport management personnel, airport user's, White Mountain Apache Tribal officials, and economic development personnel.

2.1 EXISTING AIRPORT CHARACTERISTICS

2.1.1 Location

Whiteriver Airport is located in the northeastern portion of Arizona in Navajo County. The airport is located within the Fort Apache Indian Reservation approximately one mile southwest of the Whiteriver central business district. Whiteriver lies approximately 115 miles northeast of Phoenix. Figure 2-1 provides a graphic depiction of the location of this airport in relation to nearby surface access to Whiteriver and surrounding towns.

The Whiteriver Airport property contains approximately 112 acres. The property is located in a portion of Sections 23 and 26, Township 5 North, Range 22 East of the Gila and Salt River Base and Meridian. Whiteriver Airport is designated by the FAA as Site Number 00823.A and is a public airfield. The airport location is 33° 48' 45.182" North Latitude and 109° 59' 12.357" West Longitude, according to FAA Form 5010-1, Airport Master Record.

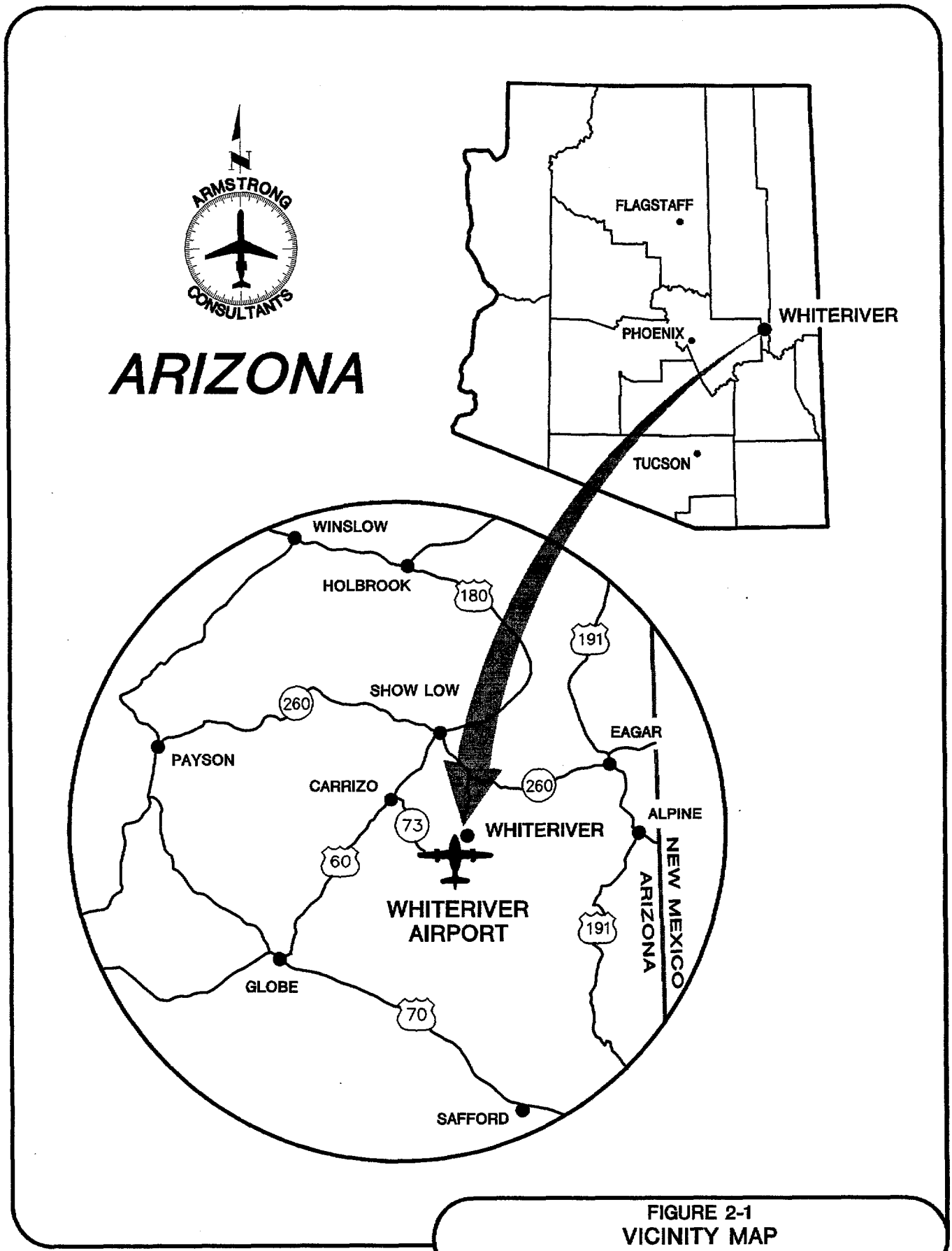


FIGURE 2-1
VICINITY MAP
WHITERIVER AIRPORT

2.1.2 Topography

Whiteriver Airport is located at an elevation of 5,152 feet Mean Sea Level (MSL). The Whiteriver Airport lies in a valley with mountains surrounding the airport in all quadrants. The land surrounding the airport is uneven with sloping surfaces. Adjacent to the airport to the west is the north fork of the White River. Terrain to the south of the airport drops sharply then levels out into cattle grazing pasture land.

2.2 CURRENT AIRPORT USERS/AIRPORT REFERENCE CODE

2.2.1 Fleet Mix

Aircraft fleet mix is the relative percentage of operations conducted by each of the four classes of aircraft shown in Table II-1 : Class A, Class B, Class C, and Class D. Table II-1 explains the type of aircraft found in each of these classes.

Based on the best available data, operations at the Whiteriver Airport consisted of 35% Class A, 45% Class B, and 20% Class C operations. There were no operations at the airport performed by Class D aircraft.

TABLE II-1
AIRCRAFT CLASSIFICATION

Aircraft Classification	Description
Class A	Single-engine (less than 12,500 pounds maximum certificated takeoff weight - MCTW).
Class B	Multi-engine (less than 12,500 pounds MCTW).
Class C	Large Multi-engine (12,500 to 300,000 pounds MCTW). Includes corporate jets
Class D	Heavy multi-engine (300,000 pounds MCTW or more).

Source: FAA AC 150/5060-5 Airport Capacity and Delay

2.2.2 Airport Reference Code

The Airport Reference Code (ARC) is a system established by the FAA which is used to relate airport design criteria to the operational and physical characteristics of the aircraft currently operating and/or intended to operate at the airport. The ARC has two components relating to the airport design aircraft. The first component of the ARC, depicted by a letter, is the Aircraft Approach Category and correlates to aircraft approach speed (operational characteristic). The second component of the ARC, depicted by a Roman numeral, is the Aircraft Design Group and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runways (primarily length) and runway facilities. Aircraft wingspan is primarily associated with separation criteria involving taxiways and taxilanes. Table II-2 has

been included to provide a definition of both Aircraft Approach Categories and Aircraft Design Groups.

TABLE II-2
AIRCRAFT APPROACH CATEGORIES & DESIGN GROUPS

AIRCRAFT APPROACH CATEGORY: An aircraft approach category is a grouping of aircraft based on an approach speed of 1.3 times the stall speed of the aircraft at the maximum certificated landing weight.

Aircraft Category	Approach Speed
Category A	Speed less than 91 knots
Category B	91 knots or more but less than 121 knots
Category C	121 knots or more but less than 141 knots
Category D	141 knots or more but less than 166 knots
Category E	166 knots or more

AIRCRAFT DESIGN GROUP: The aircraft design group subdivides aircraft by wingspan. The aircraft design group concept links an airport's dimensional standards to aircraft approach categories or to aircraft design groups or to runway instrumentation configurations. The aircraft design groups are:

Design Group	Aircraft Wingspan
Group I	Up to but not including 49 feet
Group II	49 feet up to but not including 79 feet
Group III	79 feet up to but not including 118 feet
Group IV	118 feet up to but not including 171 feet
Group V	171 feet up to but not including 214 feet
Group VI	214 feet up to but not including 262 feet

Source: FAA 150/5300-13, Airport Design

To ensure that all facilities at the Whiteriver Airport are designed to accommodate the current and expected air traffic and to meet FAA criteria, the specific ARC for the airport must be determined. In order to designate a specific ARC for an airport, the aircraft in that ARC must perform a minimum of 500 annual itinerant operations. Therefore, an evaluation of current aircraft using the Whiteriver Airport was made. A list of these aircraft types along with their specific ARC are listed in Table II-3. These aircraft include light tanker aircraft, large tanker aircraft, air patrol aircraft, and medivac aircraft.

TABLE II-3
AIRCRAFT USING WHITERIVER AIRPORT

Aircraft Type	Aircraft Owner/Sponsor	ARC[1]
Cessna 182	Ponderosa Aviation	A-I
Mitsubishi MU-2	Med Arizona	B-I
Cessna 421	Med Arizona	B-I
Rockwell AC-681	Med Arizona	B-II
BAe Jetstream 31	Native American Air	B-II
Cessna Citation	Native American Air	B-II
Rockwell AC-500	Ponderosa Aviation	B-II
Rockwell AC-680F	Ponderosa Aviation	B-II
Air Tractor 802	Queen B Aviation	B-II
McDonnell Douglas DC-4	BIA Fire Management	B-III
McDonnell Douglas DC-6	BIA Fire Management	B-III
Gates Lear 24	Med Arizona	C-I
Lockheed P-3 (L-188)	BIA Fire Management	C-III
Bell 206	Air West Helicopters	N/A

[1]*ARC: Airport Reference Code*

At the Whiteriver Airport, the aircraft type which uses Runway 01/19 and has a minimum of 500 itinerant operations annually is a British Aerospace Jetstream 31 operated by Native American Air Ambulance. This aircraft has an ARC of B-II and a maximum certificated takeoff weight of 14,550 pounds. High-tempo fire suppression operations are conducted from April through September with a Rockwell Aero Commander 500 and an Air Tractor 802. Both of these aircraft have ARCs of B-II and weigh less than 12,500 pounds. This is the only time period these aircraft are based at the airport. In the past, large tanker aircraft such as P3-Orion, with an ARC of C-III and a maximum certificated takeoff weight of 134,000 pounds, were based at Whiteriver; however, due to the deterioration of the runway the large tanker aircraft can no longer utilize the airport. Non-scheduled Medivac flights arrive and depart as needed with an average frequency of one per day throughout the year. A surge in business jet operations is seen during the fall hunting season when private individuals use the airport while they hunt large game on the reservation.

Upon rehabilitation of the pavement, large tanker aircraft are expected to occasionally utilize the airport as a reloading station. These aircraft include DC-4s and DC-6s, which have an ARC of B-III, and P-3s which have an ARC of C-III. Weights of these aircraft range from 73,000 to 134,000 pounds dual wheel gear (DWG). These aircraft are not expected to exceed 500 annual operations at Whiteriver Airport.

Table II-4 provides examples of aircraft which fall into the A-I & B-I, A-II & B-II, and B-III & C-III Airport Reference Codes. The maximum certificated takeoff weight for each representative aircraft has also been included as a reference to the aircraft classification system.

TABLE II-4
ARC & AIRCRAFT CLASSIFICATION
EXAMPLE AIRCRAFT

EXAMPLE AIRCRAFT HAVING AN ARC OF A-I OR B-I			
Aircraft	**Approach Speed (Knots)**	**Wingspan (Feet)**	**Max. T.O. Weight (Pounds)**
Beech Baron 58P	101	37.8	6,200
Beech Bonanza V35B	70	33.5	3,400
Beech King Air B100	111	45.9	11,799
Cessna 150	55	33.3	1,670
Cessna 177	64	35.5	2,500
Cessna 421	96	41.1	7,500
Cessna Citation I	108	47.1	11,850
Gates Learjet 28/29	120	42.2	15,000
Mitsubishi MU-2	119	39.1	10,800
Piper Archer II	86	35.0	2,500
Piper Cheyenne	110	47.6	12,050
Rockwell Sabre 40	120	44.4	18,650
Swearingen Merlin	105	46.3	12,500

Continued on next page

TABLE II-4(Continued)
ARC & AIRCRAFT CLASSIFICATION
EXAMPLE AIRCRAFT

EXAMPLE AIRCRAFT HAVING AN ARC OF A-II OR B-II			
Aircraft	**Approach Speed (Knots)**	**Wingspan (Feet)**	**Max. T.O. Weight (Pounds)**
BAe Jetstream 31	99	52.0	14,550
Beech E-18	87	49.2	8,750
Beech King C90-1	100	50.3	9,650
Beech Super King Air	103	54.5	12,500
Beech 1900	120	54.5	15,245
Cessna 441	100	49.3	9,925
Cessna Citation II	108	51.6	13,300
Cessna Citation III	114	50.6	17,000
Dassault Falcon 50	113	61.9	37,480
Dassault Falcon 200	114	53.5	30,650
Dassault Falcon 900	100	63.4	45,500
De Havilland Twin Otter 300	75	65.0	12,500
Embraer Brasilia	92	64.9	23,800
Grumman Gulfstream I	113	78.5	35,100
EXAMPLE AIRCRAFT HAVING AN ARC OF B-III OR C-III			
Aircraft	**Approach Speed (Knots)**	**Wingspan (Feet)**	**Max. T.O. Weight (Pounds)**
Convair 580	107	105.3	54,600
Fokker F-27	102	95.2	45,000
Fokker F-28-6000	113	82.2	73,000
MDC-DC-4	95	117.5	73,000
MDC-DC-6 A/B	108	117.5	104,000
Lockheed P-3	134	99.7	134,000

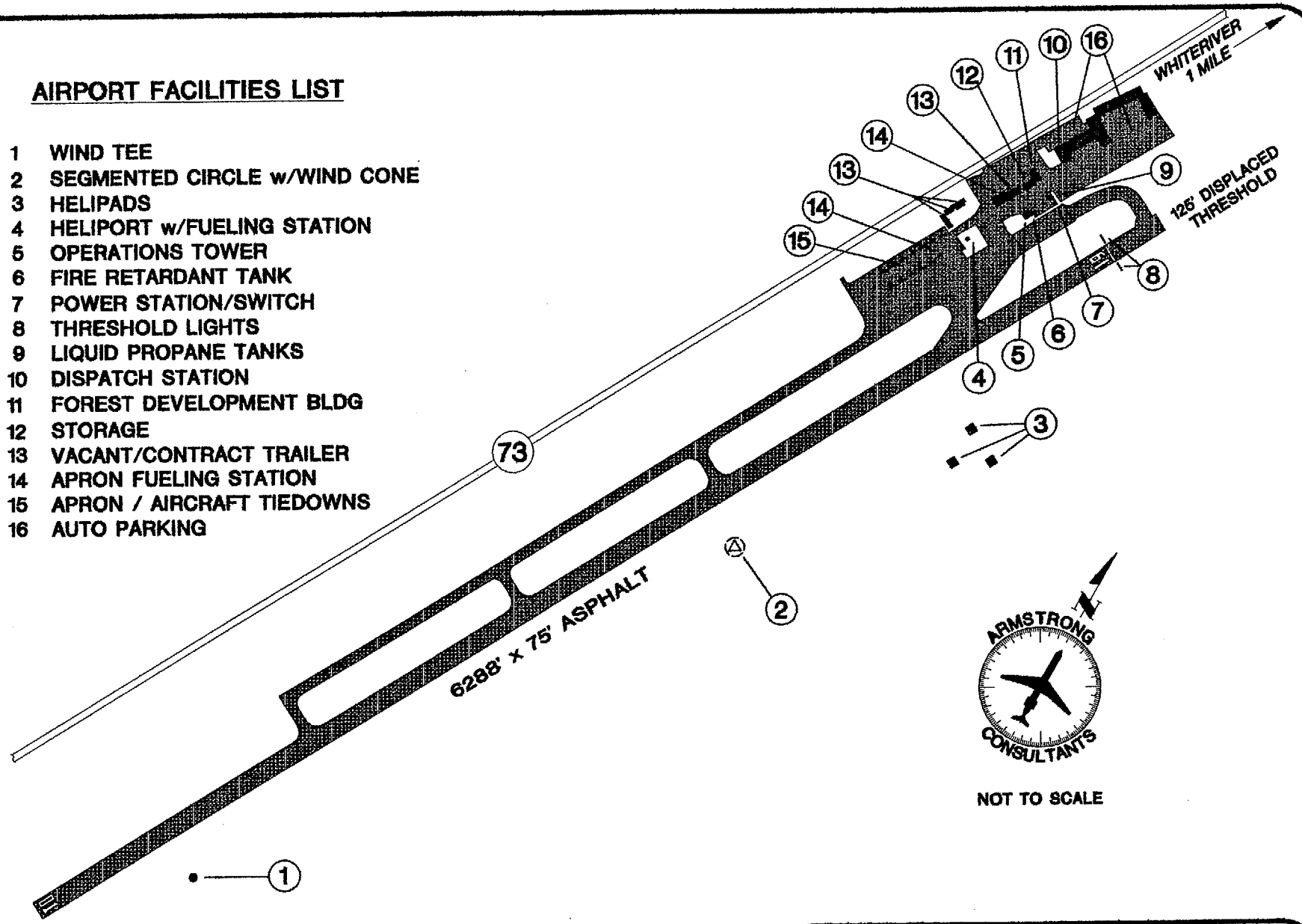
Source : AC 150/5300-13, Airport Design

2.3 AIRSIDE CHARACTERISTICS

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area, and any visual or electronic approach navigational aids. Figure 2-2 provides a graphic depiction of the existing facilities at the Whiteriver Airport.

AIRPORT FACILITIES LIST

1 WIND TEE
2 SEGMENTED CIRCLE w/WIND CONE
3 HELIPADS
4 HELIPORT w/FUELING STATION
5 OPERATIONS TOWER
6 FIRE RETARDANT TANK
7 POWER STATION/SWITCH
8 THRESHOLD LIGHTS
9 LIQUID PROPANE TANKS
10 DISPATCH STATION
11 FOREST DEVELOPMENT BLDG
12 STORAGE
13 VACANT/CONTRACT TRAILER
14 APRON FUELING STATION
15 APRON / AIRCRAFT TIEDOWNS
16 AUTO PARKING



NOT TO SCALE

FIGURE 2-2
AIRPORT FACILITIES
WHITERIVER AIRPORT

2.3.1 Runways

Whiteriver Airport currently has one runway. Runway 01/19 is 6,288 feet long, including a 125 foot displaced threshold at the approach end of Runway 19, is 75 feet wide, and is constructed of asphalt. A 1993 inspection of the runway by the FAA reported the pavement to be in fair condition. A current visual inspection revealed significant alligator cracking due to repeated use by heavy air tanker aircraft and limited pavement maintenance. Along with the associated cracking, vegetation has grown up within the cracks accelerating the disintegration of the pavement. The strength of the runway pavement is listed on the FAA Form 5010 as 16,000 pounds Single Wheel Gear (SWG).

2.3.2 Taxiways

A partial parallel taxiway extends from the approach end of Runway 19 approximately 5,200 feet to the south. The northern portion of the taxiway, adjacent to the operations tower (not an Air Traffic Control Tower), is utilized as the air tanker loading ramp and is constructed of concrete. This portion of the taxiway, along with the northern runway entrance/exit taxiway were rehabilitated in 1994 and are in good condition. The remainder of the parallel taxiway pavement is constructed of asphalt and is in fair to poor condition.

2.3.3 Aircraft Apron

The Whiteriver Airport currently has one aircraft parking apron consisting of approximately 5,100 square yards of asphalt pavement and twelve tie-down spots. The apron is adjacent to the parallel taxiway to the south of the operations tower. The aircraft parking apron surface is in poor condition and slopes downward from the northwest to the southeast corner. Several tie-down chains are broken or missing. Two helicopter parking pads are located in a designated hazard area between the aircraft parking apron and the tower (not an ATC Tower). Three additional helipads have been constructed on the east side of the runway.

2.3.4 Airfield Lighting and Visual Aids

Guidance on airport lighting standards is provided in FAA Advisory Circular (AC) 150/5340-24. Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground.

Several common airfield lighting features of general aviation airports include a rotating beacon (activated by photoelectric cell for dusk to dawn operations), Medium Intensity Runway Lights (MIRLs) activated by aircraft radio signal, threshold lights and Runway End Identifier Lights (REILs) which mark the runway threshold with flashing strobe lights, Medium Intensity Taxiway Lights (MITLs) and/or retroflective markers, and Precision Approach Path Indicators (PAPIs) to provide descent guidance information during an approach to the runway.

The Whiteriver Airport has Medium Intensity Runway Lights (MIRLs), has Medium Intensity Taxiway Lights (MITLs) located at each exit taxiway only, and has Runway Threshold Lights. Visual aids provided at the Whiteriver Airport include non-lighted wind cones at the northern and southern ends of the runway and a lighted wind tee and segmented circle at approximately the midpoint of the runway. The lighting system is reported to be unreliable with lighting outages occurring frequently. The system is in need of upgrade and/or repair.

2.3.5 Navigational Aids

The Whiteriver Airport does not currently have any ground-based navigational aids on the airport property to aid pilots in enroute or in terminal area operations. However, there are several navigational aids within the Whiteriver area (identified in Figure 2-4) which help provide directional aid to the Whiteriver Airport. The closest navigational aid to Whiteriver is the Show Low NDB (Non-Directional Beacon) located 27 nautical miles (NM) north of Whiteriver. The St. Johns VORTAC (Very High Frequency Omnidirectional Range with Tactical information) is located approximately 24 NM to the northeast. Approximately 105 NM to the west is the Phoenix VORTAC, and to the south-southeast approximately 104 NM is the San Simon VORTAC.

2.4 LANDSIDE CHARACTERISTICS

Landside characteristics of an airport are described as those facilities not included as airside characteristics. Examples of landside facilities are any structures adjoining the airfield, the access routes to and from the facility, terminal buildings, and auto parking areas.

2.4.1 Airport Services/Fixed Base Operations

A Fixed Base Operator (FBO) is usually a private enterprise that leases land from the airport sponsor on which to provide services to based and transient aircraft. The extent of the services provided vary from airport to airport; however, these services frequently include aircraft fueling, minor maintenance and repair, aircraft rental and/or charter services, flight instruction, pilot lounge and flight planning facilities, and aircraft tie-down and/or hangar storage.

Currently Whiteriver Airport does not have a Fixed Base Operator at the airport. The airport is operated and maintained by the Bureau of Indian Affairs, Fire Management Center. During the months of April through October, contract air patrol and tanker aircraft are based at the airport. During this period one of the contractors, Ponderosa Aviation, provides 100LL fueling services to based and transient aircraft.

Pilots broadcast advisories and intentions to land, taxi, and depart over Unicom frequency 122.8. The Unicom is monitored 7:00 AM to 5:30 PM Monday

through Friday, April through October. The Unicom is unmonitored at other than those times.

2.4.2 Building Area

The building area at Whiteriver Airport has been developed along the northwestern side of Runway 01/19. Ground vehicle access extends directly onto airport property from State Highway 73.

Figure 2-2 provides the existing layout of the building area and facilities at Whiteriver Airport. The Fire Management Center occupies the majority of the facilities and includes a dispatch office, radio shop, training rooms, equipment warehouses, and repair shops. Other facilities include trailers for the contract aircraft operators and the air operations tower. The air operations tower is used to monitor flightline activity during peak operations, and is not an FAA air traffic control facility.

Table II-1 provides a listing of specific characteristics of the buildings at the Whiteriver Airport. In the tabulation, building numbers are referenced to Figure 2-2.

TABLE II-5
EXISTING BUILDING CHARACTERISTICS

Building Number	Type of Building	Approximate Height [1]	Condition	Construction Materials	Utilities [2]
1	Fire Management Center (Radio Shop Antenna)	27 feet (69 feet)	Good	Metal Siding	E, W, S
2	Forest Department	11 feet	Good	Metal Siding	E, W, S
3	Storage Building	11 feet	Good	Wood Frame, Metal Siding	
4	Vacant Trailer/ Pilots Lounge	11 feet	Good	Metal Siding	E
5	Helitack Shack	9 feet	Good	Metal	
6	Contract Operators Trailers	8 feet	Good	Metal	E, W (Hookups)
7	Operations Tower (Antenna)	25 feet (44 feet)	Good	Wood Frame and Siding	E

[1] *Listed height is to the top of the highest structure on the building.*
[2] *Utilities = E - Electricity; W - Water; S - Sewer*

2.4.3 Utilities

Utility services to the airport include electricity, water, sewer, and telephone service. Electricity service is provided by Navopache Electric Co-Op, water and sewer service is provided by the White Mountain Tribal Utility Authority, and telephone service is provided by Citizens Telecom.

2.4.3 Aircraft Fuel Facilities

Aircraft fuel services are often provided by a Fixed Base Operator (FBO) or the airport sponsor. Combinations of 100LL Aviation Gas and/or Jet-A fuel are usually provided depending on the aircraft traffic mix. Storage for these fuels may consist of underground storage tanks, above ground storage tanks, fuel trucks, or a combination of the three.

The Whiteriver Airport previously had five underground fuel tanks of various sizes for automobile fuel, aviation gas (AV Gas), and jet fuel. All tanks have been removed except for the 5,000 gallon Jet-A fuel tank. From April through October Ponderosa Aviation utilizes a 5,000 gallon fuel truck to supply their own 100LL fuel. They also offer fuel sales to other based and transient aircraft during this period. A new 5,000 gallon 100LL above ground fuel tank is expected to be installed within the next year.

2.4.4 Airport Fencing

The primary purpose of airport fencing is to prevent unwanted intrusions by persons or animals onto airport property. Airport fencing provides increased safety and security for the airport. It is normally installed along the perimeter of the airport property and outside any of the safety areas defined by the Federal Aviation Administration (FAA) in Advisory Circular (AC) 150-5300-13 and Federal Aviation Regulation (FAR) Part 77.

Airport fencing at the Whiteriver Airport consists of four strand barbed wire fence along all perimeters of the airport except for the southeastern perimeter, which is adjacent to the White River channel and is not currently fenced. Additionally, five foot chain linked fence topped with serpentine barbed wire is installed between public areas and operating areas. Manual gates allow access for personnel and vehicles to the operating areas.

2.5 ACCESS

2.5.1 Airport Access

Whiteriver Airport is located approximately 115 miles northeast of Phoenix, Arizona. The main regional surface routes are Interstate 40, U.S. Highway 60 and State Highway 77. Interstate 40 is a major east-west connection to the southwest. U.S. Highway 60 runs north to south connecting Show Low and

Globe. State Highway 77 traverses from Holbrook to Tucson through Snowflake, Show Low, and Globe.

Local access roads to Whiteriver Airport are depicted in Figure 2-1 and include State Highway 73, which connects to U.S. Highway 60/State Highway 77 to the west and State Highway 260 to the east. The airport is located directly on State Highway 73 approximately one mile southwest of the Whiteriver business district.

2.5.2 Transportation Alternatives

The main surface transportation routes to the Whiteriver area were described previously. Rail service for freight shipments is provided by Burlington-Santa Fe Railway and Apache Railway. The closest Amtrak station offering passenger rail service is located in Winslow, approximately 115 miles northwest of Whiteriver. Commercial bus lines offering transportation throughout the region include Greyhound Bus Lines, Navajo Transit System, and White Mountain Passenger Lines.

2.6 OTHER AIRPORT CHARACTERISTICS

2.6.1 Control of Airport Property

Under current FAA Guidelines, an airport sponsor must be able to prove their ability to control that land on which airport development has occurred or is being planned to occur, for a minimum of twenty years.

The Whiteriver Airport is situated entirely on land owned and controlled by the sponsor, the White Mountain Apache Tribe. Therefore, the sponsor maintains adequate control of airport property for existing requirements and future development. Land use controls are established through the adoption of zoning ordinances and/or land use plans. A zoning ordinance and/or land use plan should be developed and implemented pursuant to and in accordance with recommendations contained in this Airport Master Plan.

2.7 AIRSPACE CHARACTERISTICS

2.7.1 Area Airports/Service Area

An airport service area is defined by the communities and surrounding areas served by the airport facility. For example, factors such as the airport's surrounding topographical features (mountains, rivers, etc.), proximity to its users, quality of ground access, required driving time to the airport, and the proximity of the facility to other airports which offer the same or similar services can all affect the size of a particular airport's service area. To define the service area for Whiteriver Airport, Armstrong Consultants first reviewed the airports and their specific services and facilities within a 60 nautical mile radius. This information is displayed in Table II-6.

By examining the information in Table II-6, it is evident that the current facilities at Whiteriver Airport are similar to the surrounding airports except for Show Low and St. Johns which offer instrument approaches. To determine the service area it is important to establish the furthest ground distance which pilots are willing to travel in order to operate out of the Whiteriver Airport. The National Plan of Integrated Airport Systems recommends the airport serve a community within a 30 minute driving time of the airport. Assuming an average driving speed of 45 miles per hour, this results in a service area radius of approximately 23 miles. A 23 mile service area surrounding Whiteriver Airport is applicable except to the north, where the distance is split between Show Low Airport and Whiteriver Airport, as depicted in Figure 2-3.

TABLE II-6
AIRPORTS SURROUNDING WHITERIVER AIRPORT

Airport Name and Location	Distance from Whiteriver (in NM [1])	NPIAS Status [2]	Runway Length(s)	Pavement Type	Instrument Approaches [3]	Fuel Available
Whiteriver (Whiteriver, AZ)	N/A	GA-BU	6288 x 75	Asphalt	VFR	100LL
Show Low (Show Low, AZ)	26 north	GA-BU	6000 x 75 3930 x 60	Asphalt Asphalt	NDB, GPS	100LL Jet
Globe-San Carlos (Globe, AZ)	36 southwest	GA-BU	5804 x 75	Asphalt	VFR	100LL Jet
Taylor (Taylor, AZ)	39 north	GA-BU	7200 x 75	Asphalt	VFR	100LL
St. Johns (St. Johns, AZ)	52 northeast	GA-BU	5323 x 75 3400 x 60	Asphalt Asphalt	VOR/DME, GPS	100LL Jet
Reserve (Reserve, NM)	56 east	GA-BU	4800 x 50	Asphalt	VFR	None
Safford (Safford, AZ)	59 south-southeast	GA-GU	6015 x 100 4800 x 75	Asphalt Asphalt	VFR	100LL Jet

Abbreviations included in Table II-6
[1] NM = Nautical Miles
[2] NPIAS = National Plan of Integrated Airport Systems
Categories included in table:
GA-General Aviation
BU -Basic Utility
GU-General Utility
[3] VOR = Very High Frequency Omnidirectional Range
DME= Distance Measuring Equipment
VFR = Visual Flight Rules
NDB= Non Directional Beacon

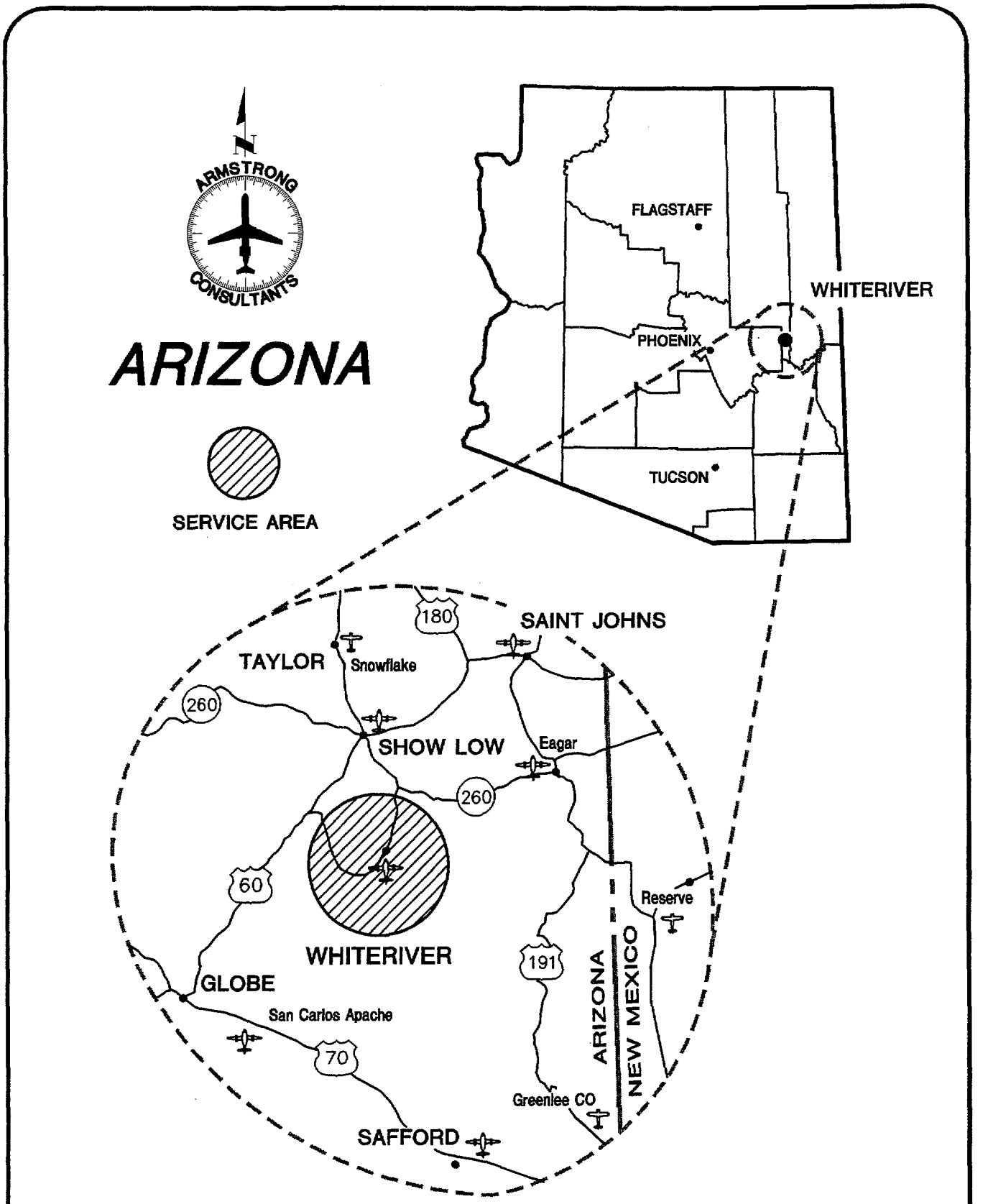


FIGURE 2-3
SERVICE AREA
WHITERIVER AIRPORT

2.7.2 Surrounding Airspace

Figure 2-4 provides a depiction of the airspace surrounding the Whiteriver Airport. The closest VOR to Whiteriver Airport is the St. Johns VOR located 55 NM to the northeast. Other surrounding VOR's include San Simon located 100 NM southeast and Phoenix located 100 NM to the west. An NDB is located at Show Low, 26 NM to the north, and at Globe-San Carlos, located 36 NM southwest, however it is currently inoperative. Several Victor routes extend from the St. Johns VOR to other area navigational aids or airports, but none of these lead directly towards Whiteriver Airport.

2.7.3 Airspace Jurisdiction

Pilots broadcast advisories and intentions to land, taxi, and depart over Unicom frequency 122.8. The Unicom is monitored by the air operations staff from 7:00 AM to 5:30 PM Monday through Friday, April through October. The Unicom is unmonitored at other than those times.

The Whiteriver Airport is located within the jurisdiction of the Albuquerque Air Route Traffic Control Center (ARTCC) and the Prescott Flight Service Station (FSS). The current frequencies for Albuquerque ARTCC are 128.2 or 132.9. The altitude of radar coverage by the Albuquerque ARTCC may vary as a result of the FAA navigational/radar facilities in operation, weather conditions, and surrounding terrain. The Prescott FSS provides additional weather data and other pertinent information to pilots on the ground and enroute. Pilots can contact the Prescott FSS directly on radio frequency 122.4.

2.7.4 Airspace Restrictions

Due to the close proximity of high terrain and residential development on the west side of the airport, a right hand traffic pattern is utilized for Runway 01.

Restricted airspace designated as R-2310A/B/C is located approximately 75 NM southwest of Whiteriver Airport. This airspace encompasses approximately 39 square miles and is not authorized for overflight.

The Whiteriver Airport is situated within the Jackal Military Operating Area (MOA). Use of this MOA occurs Monday through Friday from 7:00 AM to 6:00 PM, and intermittently on weekends as indicated by NOTAM. The MOA airspace includes altitudes of 11,000 feet or 3000 feet above ground level (AGL) whichever is higher up to but not including 18,000 feet (FL 180). Additional MOAs nearby Whiteriver Airport include Outlaw, Jackal Low, Morenci, and Reserve. See Figure 2-4 for the location of these MOAs.

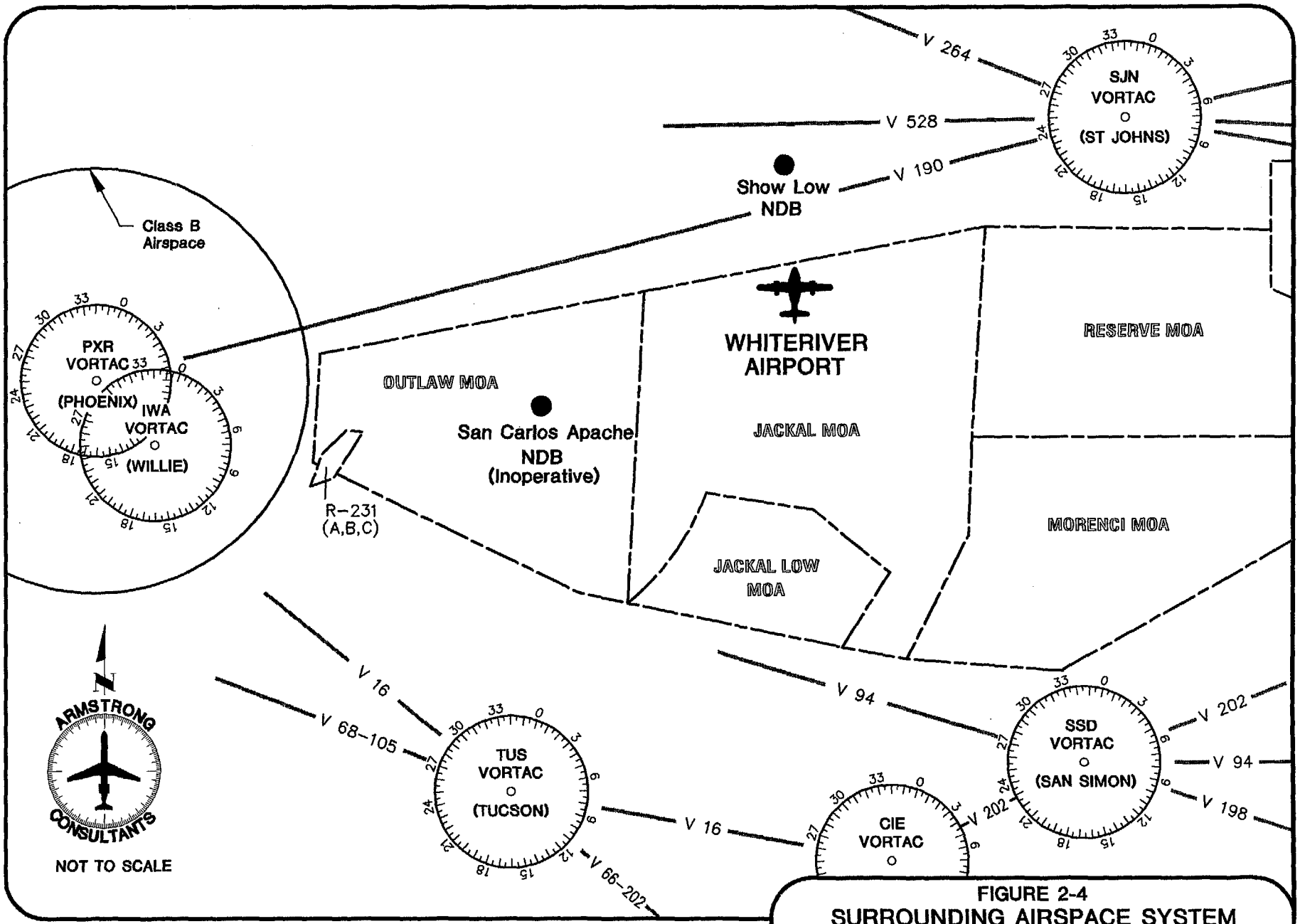


FIGURE 2-4
SURROUNDING AIRSPACE SYSTEM
WHITERIVER AIRPORT

2.8 AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF)

2.8.1 Fire Fighting

The Whiteriver Fire Department is responsible for responding to emergencies at the Whiteriver Airport. The Department consists of four full-time personnel and 20 part-time paid on call personnel. The Cibeque and McNarry Fire Departments provide additional support if needed. All Whiteriver Fire Department personnel are Emergency Medical Technician (EMT) certified, with ten personnel having advanced emergency medical training.

The Whiteriver Fire Department is located approximately one-half mile from the airport with a response time of one to two minutes. Their equipment consists of one tanker, one pumper, two rescue trucks, and six brush trucks, all of which are foam capable. Table II-7 lists the Whiteriver Fire Department assets.

TABLE II-7
WHITERIVER FIRE DEPARTMENT ASSETS

Distance from Airport: ½ miles		**Response Time:** 1-2 minutes	
Personnel			
Full-Time: 4	Part-Time: 20		
Equipment	**Storage (Gal.)**	**Dispensing Capability (GPM)[1]**	**Remarks**
Tanker Truck	3000	1250	25-30 Gal. Foam
Pumper Truck	1000	1250	25-30 Gal. Foam
Rescue Truck	300	180	50 Gal. Foam
Crash Rescue Truck	500	500	55 Gal. Foam
Brush Trucks (6)	250	70-80	Small Pumps. Foam Capable

[1]*GPM: Gallons Per Minute*

2.8.2 Ambulance Service

Emergency Medical Service (EMS) to Whiteriver Airport is provided by the Whiteriver Medical Service Unit operating out of the Whiteriver Indian Health Service Clinic. The Medical Service has two ambulance units stationed in Whiteriver and two units in Cibeque. One unit is on-call full-time at Whiteriver, with a backup unit provided on Friday, Saturday, Sunday, and Monday. Response time to the airport from Whiteriver is 8 to 10 minutes. Backup unit response time from Cibeque is approximately one hour.

The local clinic is used for treatment of minor injuries and to stabilize critical patients for ground transport to Navopache Hospital, located in Show Low, or medivac air lift to Tucson or Phoenix.

2.8.3 Airport Security

The White Mountain Tribal Police Department provides police coverage for the Whiteriver area, including the airport. Occasional drive by patrols are provided to the airport as part of the overall patrols throughout the community. A 24 hour security watchman is employed at the airport during the peak operational period from May through August. Reports from airport management indicate that vandalism of the runway and exit taxiway lights are a problem.

2.9 METEOROLOGICAL CONDITIONS

Meteorological conditions have a direct impact on the operational characteristics of an airport. These conditions determine the regulations under which operations may be conducted, the frequency of use for each operational configuration, and the instrumentation required to assist aircraft in landing and departing.

2.9.1 Local Climatological Data

The Whiteriver area experiences a temperate climate. Average annual precipitation for the area is 24.7 inches. Daily maximum temperatures from October to March average 51°F, and from April to September average 73°F. The average annual minimum temperature is 30.8°F, and the average daily maximum temperature of the hottest month is 80.5°F (July).

Density Altitude: An extremely important meteorological factor to pilots is density altitude. Density altitude is not a height reference. Rather, it is used as an index of aircraft performance. Air density is determined by air pressure, temperature, and humidity. As the altitude increases, the air density decreases; however, air density also decreases with high temperatures and high humidity. This means that high altitudes or conditions of high temperature or humidity cause the air to be thinner than at lower altitudes, temperatures, or humidities. The combination of high temperatures, high humidity, and increased altitude result in an increasing high density altitude condition. High density altitude reduces performance in all types of aircraft.

The results of a high density altitude include increased takeoff and landing rolls and a reduced rate of climb. Density altitude is most dangerous when other contributing factors are involved, such as heavy loads, calm winds, short runways, unfavorable runway conditions, and obstructions near the end of the runway. Density altitude is a concern at the Whiteriver Airport, given its elevation, high summer temperatures, and runway length.

2.9.2 Ceiling and Visibility Conditions

Ceiling and visibility conditions at the Whiteriver Airport are important considerations since the occurrence of low ceiling and/or poor visibility conditions limit the use of the airport to instrument approach and departure operations until conditions change. Under poor visibility conditions or Instrument Meteorological Conditions (IMC), the pilot must operate under Instrument Flight Rules (IFR), rather that Visual Flight Rules (VFR). Under Instrument Flight Rules, the pilot maneuvers the aircraft through reference to instruments in the aircraft and navigational aids on the ground. The airport must be closed for use when conditions are worse than the published IFR minimums for that airport. When flight conditions are VFR, the pilot can maneuver the aircraft by reference to the horizon and objects on the ground.

Whiteriver Airport has visual approaches which may only be utilized under VFR conditions, when ceilings are above minimums. Definitions for the weather conditions which affect Whiteriver Airport are listed below.

- VFR - Visibility of three statute miles with the distance from clouds of 500 feet below, 1,000 feet above, and 2,000 feet horizontal.

- Below Minimums - Ceiling is less than the defined ceiling or visibility less than the minimums described above for each specific category of aircraft.

2.9.3 Runway Wind Coverage

Wind direction and speed determine the desired alignment and configuration of the runway system. Aircraft land and takeoff into the wind and therefore can tolerate only limited crosswind components (the percentage of wind perpendicular to the runway centerline). The ability to land and takeoff in crosswind conditions varies according to pilot proficiency and aircraft type.

An accurate analysis of wind data must be made in order to determine the orientation and number of runways required. FAA Advisory Circular 150/5300-13 recommends that a runway should yield a 95 percent wind coverage under stipulated crosswind components. If one runway does not meet this 95 percent coverage, then construction of an additional runway may be advisable. The crosswind component of wind direction and velocity is the resultant vector which acts at a right angle to the runway. It is equal to the wind velocity multiplied by the trigonometric sine of the angle between the wind direction and the runway direction. The allowable crosswind component for each Airport Reference Code is shown in Table II-8.

TABLE II-8
ALLOWABLE CROSSWIND COMPONENT

Allowable Crosswind in Knots	Airport Reference Code
10.5 Knots	A-I & B-I
13 Knots	A-II & B-II
16 Knots	A-III, B-III, & C-I through D-III
20 Knots	A-IV through D-VI

Source: FAA AC 150/5300-13.

A remote weather observation system is located on the Whiteriver Police Department building approximately two miles south of the airport. This system is maintained by the U.S. Forest Service primarily for fire fighting purposes. Wind data recorded hourly from this station in 1996 was obtained from the Forest Service. Analysis of this data generated the wind rose depicted in Figure 2-5. Further analysis resulted in a 10.5 knot crosswind coverage for Runway 01/19 of 99.74% and a 13.0 knot crosswind coverage of 99.90%.

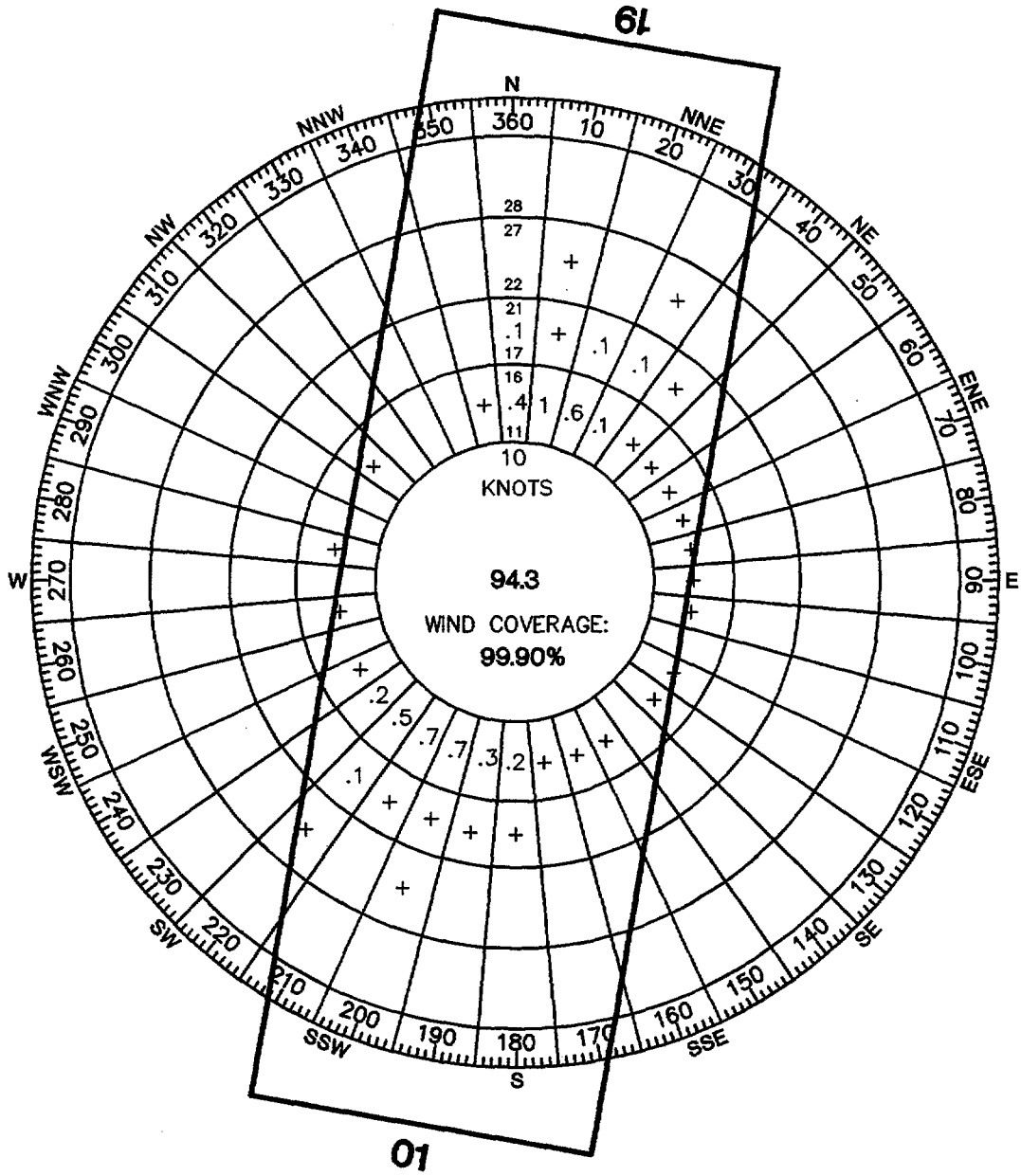
2.10 AIRPORT IMAGINARY SURFACES

Federal Aviation Regulations (FAR) Part 77 establishes several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in Figure 2-6. The Primary, Approach, Transitional, Horizontal, and Conical Surfaces identified in FAR Part 77 are applied to each runway at both existing and new airports on the basis of the type of approach procedure available or planned for that runway and the specific FAR Part 77 runway category criteria. For the purpose of this section, a visual/utility runway is a runway that is constructed for and intended to be used by propeller driven aircraft of 12,500 pounds maximum gross weight and less. A visual runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds and using only visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan, or by any planning document submitted to the FAA by competent authority. A nonprecision instrument runway is a runway with an approved or planned straight-in instrument approach procedure which has no existing or planned precision instrument approach procedure.

Runway 01/19 is currently classified as a visual runway with visual approaches. The runway's present design aircraft group as stated earlier in this chapter is a B-II with aircraft weighing 60,000 pounds or less.

2.10.1 Primary Surface

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but does not extend past the end of non-paved



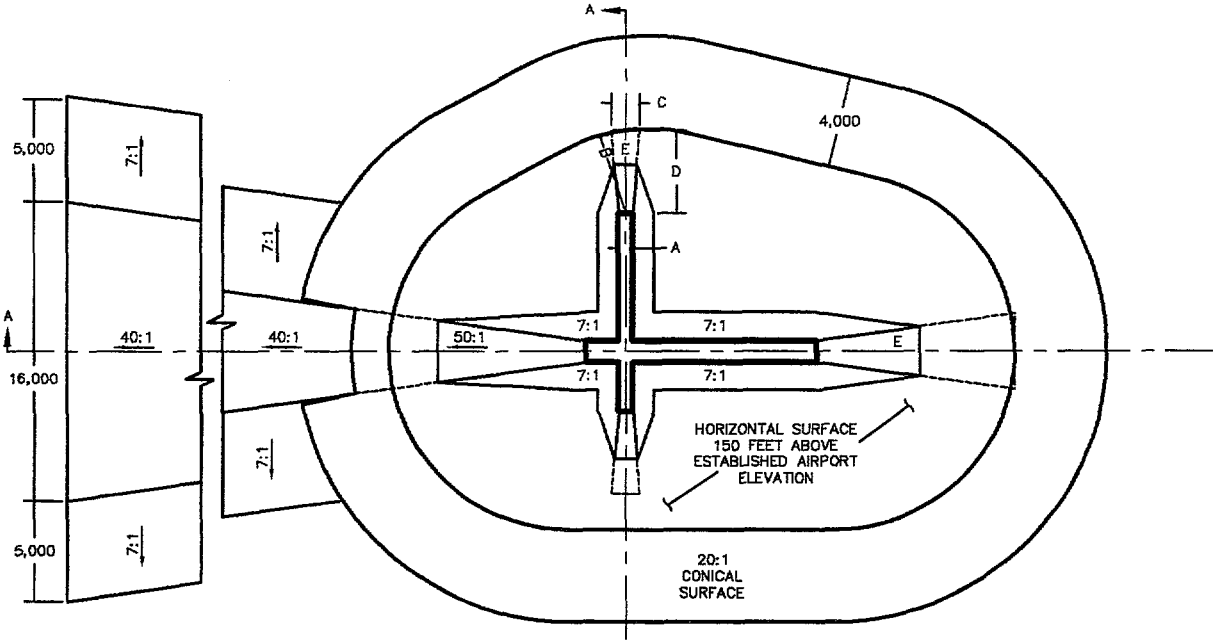
ALL WEATHER WIND ROSE

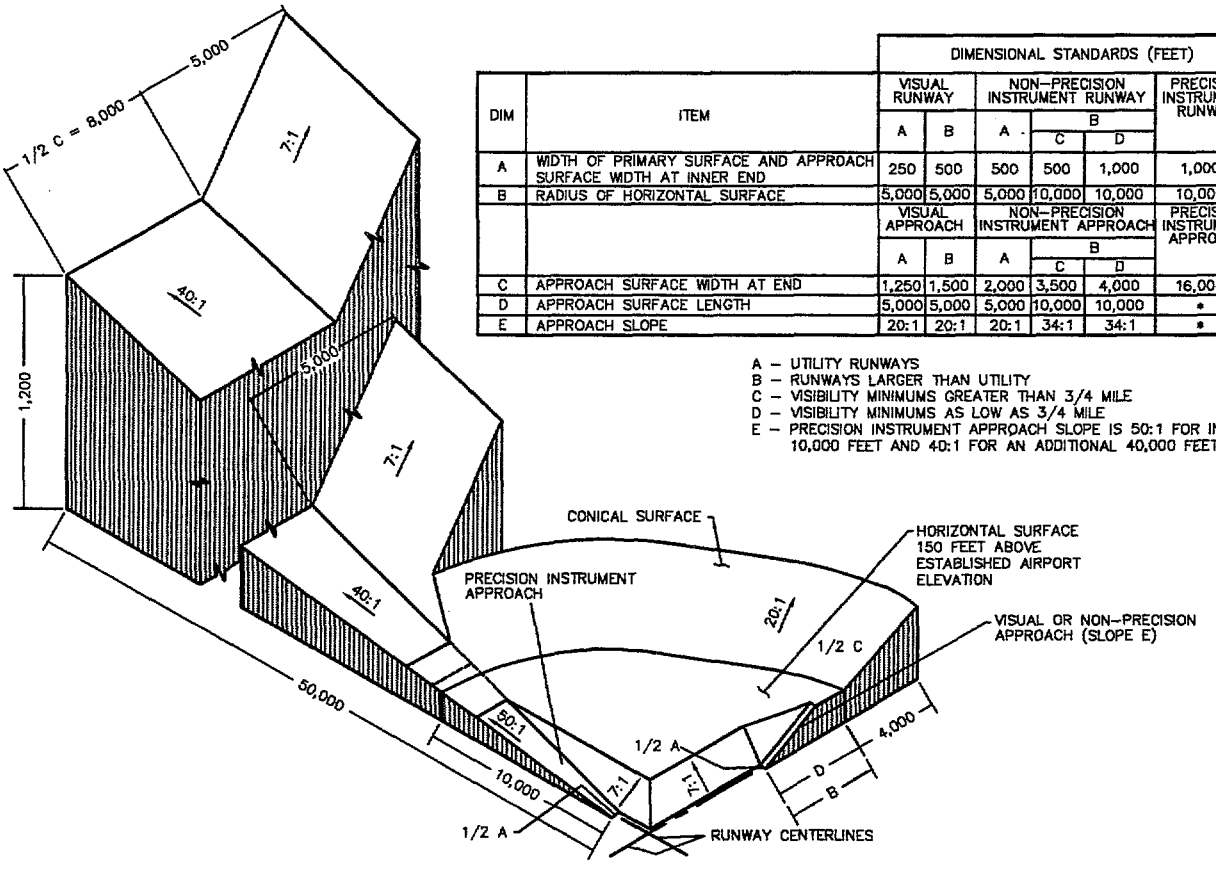
SOURCE: U.S. FOREST SERVICE, REMOTE WEATHER OBSERVATION SYSTEM, WHITERIVER, ARIZONA

JANUARY 1996 - DECEMBER 1996

10.5 KNOT CROSSWIND COVERAGE RUNWAYS 01/19 = 99.74%
13.0 KNOT CROSSWIND COVERAGE RUNWAYS 01/19 = 99.90%

FIGURE 2-5
ALL WEATHER WIND ROSE
WHITERIVER AIRPORT





DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A – UTILITY RUNWAYS
B – RUNWAYS LARGER THAN UTILITY
C – VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D – VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E – PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

ISOMETRIC VIEW OF SECTION A–A
§ 77.25 CIVIL AIRPORT IMAGINARY SURFACES

FIGURE 2-6
IMAGINARY SURFACES
WHITERIVER AIRPORT

runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The existing width of the Primary Surface at Whiteriver Airport for Runway 01/19 is 500 feet.

2.10.2 Approach Surface

The Approach Surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface is applied to each end of the runway based upon the type of approach available or planned for that runway. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the FAR Part 77 runway classification criteria.

The existing dimensions for the Approach Surfaces for Runway 01 and Runway 19 measure 500 feet at the inner width, 1,500 feet at the outer width, 5,000 feet in length, and have a slope of 20 to 1.

2.10.3 Transitional Surface

The Transitional Surface extends outward and upward at right angles to the runway centerline from the sides of the Primary and Approach Surfaces at a slope of 7:1 and ends at the Horizontal Surface.

2.10.4 Horizontal Surface

The Horizontal Surface is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in FAR Part 77, the Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The perimeter is constructed by arcs of specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways. The elevation of the Whiteriver Airport is 5,152 feet MSL. The elevation of the Horizontal Surface is 5,302 feet MSL, and the radii of the arcs are 5,000 feet for both Runways 01/19.

2.10.5 Conical Surface

The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet. The Conical Surface elevations at the Whiteriver airport are 5,302 feet MSL for the inner surface and 5,502 feet MSL for the outer surface.

2.11 OBJECTS AFFECTING NAVIGABLE AIRSPACE

The criteria for objects affecting navigable airspace (obstructions) contained in FAR Part 77 apply to existing and proposed manmade objects, and objects of natural growth and terrain. These criteria indicate the "critical" areas in the vicinity of airports which

should be kept free of obstructions. "Secondary" areas may contain obstructions, if they are determined to be non-hazardous by an FAA aeronautical study and if they are marked and lighted as specified in the aeronautical study determination. Airfield navigational aids or lighting and visual aids by nature of their location may constitute obstructions, but these objects do not violate FAR Part 77 requirements as they are essential to the operation of the airport.

The transitional surface on the north side of the runway is penetrated by the operations tower and the radio shop antenna. The Primary Surface is penetrated by the wind socks and wind tee. These items should be obstruction marked and lighted. A National Ocean Service's Obstruction Chart for the Whiteriver Airport was not available for reference; however, the obstructions will be shown on the Part 77 Airspace Drawing which will be completed as part of this Airport Master Plan.

2.12 RUNWAY & TAXIWAY STANDARDS

As previously discussed, the Airport Reference Coding (ARC) system is used to relate airport design criteria to the operational and physical characteristics of the critical aircraft intended to operate at the airport. The design or critical aircraft must also have over 500 itinerant operations per year to be considered the design aircraft, and usually has the largest wingspan and the fastest approach speed. Those aircraft having an ARC of B-II and weighing less than 60,000 pounds should be considered the existing design aircraft for Runway 01/19. The future design aircraft will be discussed in Chapters IV and V, Forecasts of Aviation Activity and Facility Requirements. Runway standards for Whiteriver Airport were developed using FAA guidelines to provide the airport operator with a selection of various widths, clearances and separations related to the critical aircraft design group and approach category for the airport.

2.12.1 Obstacle Free Zone (OFZ) and Object Free Area (OFA)

As established in FAA Advisory Circular 150/5300-13, Chapter 3, the OFZ is a three dimensional volume of airspace which supports the transition of ground to airborne aircraft operations. The clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual NAVAIDS (Navigational Aids) that need to be located in the OFZ because of their function.

The Runway OFZ is similar to the FAR Part 77 Primary Surface insofar that it represents the volume of space longitudinally centered on the runway. It extends 200 feet beyond the end of each runway. For the Whiteriver Airport, the width of the Runway OFZ is 400 feet.

The Runway Object Free Area (ROFA) is a two dimensional ground area surrounding the runway. The runway OFA standard precludes parked airplanes, agricultural operations, and objects, except for objects that need to be located in the ROFA for air navigation or aircraft ground maneuvering purposes. The ROFA for Runway 01/19 is 500 feet wide and extends 300 feet past the runway threshold.

The parallel taxiway and the service road which traverses the east end of the runway penetrate the ROFZ and ROFA. The parallel taxiway/runway separation is further discussed in 2.12.4.

The Taxiway Object Free Area (TOFA) standard is 131 feet. Objects which penetrate the TOFA include the chain link security fence surrounding the automobile parking area, the fire suppression slurry storage tanks, and the electrical switch house.

2.12.2 Runway Protection Zones (RPZ)

The RPZ is trapezoidal in shape and centered about the extended runway centerline. It begins 200 feet beyond the end of the area usable for takeoff or landing. The RPZ dimensions are functions of the design aircraft, type of operation, and visibility minimums, and are specified in FAA AC 150/5300-13, Table 2-4.

Runway 01/19 requires Runway Protection Zones for visual approach minimums and aircraft with an Airport Reference Code of B-II. This criteria results in Runway Protection Zones with dimensions of 500 feet at the inner width, 700 feet at the outer width, and a length of 1,000 feet.

While it is desirable to clear all objects from the RPZ, uses such as agricultural operations (provided they do not attract birds), and golf courses are normally acceptable. Land uses which are prohibited from the RPZ include residences and places of public assembly, such as churches, schools, hospitals, office buildings, shopping centers, and other uses with similar concentrations of people.

The land on which the RPZs occur presently meet the FAA recommendations.

2.12.3 Safety Areas

Runway and Taxiway Safety Areas are a defined surface surrounding the runway or taxiway prepared specifically to reduce the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway or taxiway.

The Safety Areas must be:

- Cleared and graded and have no potentially hazardous surface variations
- Drained so as to prevent water accumulation
- Capable, under dry conditions, of supporting snow removal equipment, ARFF equipment and the occasional passage of aircraft without causing structural damage to the aircraft
- Free of objects, except for objects that need to be located in the runway or taxiway safety area because of their function

Runway 01/19 has a Safety Area which is 150 feet wide and extends 300 feet past the runway threshold. The ground profile extending off the approach end of Runway 01 does not meet the FAA distance and grading standards in AC 150/5300-13. Acceptable grading extends approximately 50 feet from the runway end, then the terrain drops down sharply. Therefore, an acceptable 300 feet of graded safety area is not provided. Additionally, the service road which traverses the approach end of Runway 19 penetrates the RSA.

The width of the Taxiway Safety Area, as recommended by AC 150/5300-13 is 79 feet. Measures should be taken throughout the development of the airport to ensure the requirements listed above are met.

2.12.4 Runway-Parallel Taxiway Separation Standards

Separation standards for the runway and parallel taxiway are designed as such to satisfy the requirement that no part of an aircraft (tail tip, wing tip) on the taxiway centerline is within the runway obstacle free zone (OFZ). The distance is measured from runway centerline to taxiway centerline and is based on the Aircraft Design Group. Based on the existing aircraft design group at Whiteriver Airport (Design Group-II) the required runway-taxiway separation standard is 240 feet.

The current runway-taxiway separation at Whiteriver Airport is 200 feet, which does not meet the FAA design criteria. The width of this taxiway is 35 feet, which does meet the FAA minimum design width of 35 feet.

2.13 LINE OF SIGHT

FAA Advisory Circular 150/5300-13, Airport Design, sets guidelines for appropriate runway gradients to allow for adequate line of sight along the runway surface. These guidelines state that along individual runways, an acceptable runway profile permits any two points five feet above the runway centerline to be mutually visible for the entire runway length. A centerline profile was studied for Runway 01/19 at Whiteriver Airport, and the line of sight is acceptable according to FAA standards.

2.14 SUMMARY OF DIMENSIONAL CRITERIA

The following Table II-9 summarizes the dimensional standards described above for the existing conditions (ARC of B-II weighing less than 60,000 pounds) at Whiteriver Airport.

TABLE II-9
SUMMARY OF DIMENSIONAL CRITERIA
WHITERIVER AIRPORT

Standard	Existing Dimensions	
Horizontal Surface		
Elevation	5,302 feet MSL	
Radius of arcs	5,000 feet	
Conical Surface		
Slope	20:1	
Inner elevation	5,302 feet MSL	
Outer elevation	5,502 feet MSL	
Transitional Surface - Slope	7:1	
Primary Surface		
Width	500 feet	
Length beyond runway end	200 feet	
Approach Surface	Runway 01	Runway 19
Inner width	500 feet	500 feet
Outer width	1,500 feet	1,500 feet
Length	5,000 feet	5,000 feet
Slope	20 : 1	20 : 1
Runway Obstacle Free Zone		
Width	400 feet	
Length beyond runway end	200 feet	
Runway Object Free Area		
Width	500 feet	
Length beyond runway end	300 feet	
Runway Protection Zone	Runway 01	Runway 19
Inner Width	500 feet	500 feet
Outer Width	700 feet	700 feet
Length	1,000 feet	1,000 feet
Runway Safety Area		
Width	150 feet	
Length beyond runway end	300 feet	
Taxiway Object Free Area		
Width	131 feet	
Taxiway Safety Area		
Width	79 feet	
Runway-Taxiway Separation		
Standard	240 feet	
Actual	200 feet	

Source: FAR Part 77 and FAA Advisory Circular 150/5300 -13, Airport Design